

SEQUENCE LISTING

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Rolf-Guenther Werner

<120> Methods for Large Scale Production of Recombinant  
DNA-Derived tPA or K2S Molecules

<130> 0652.2190001

<150> 60/268,574  
<151> 2001-02-15

<150> GB 0027779.8  
<151> 2000-11-14

<160> 25

<170> PatentIn Ver. 2.1

<210> 1  
<211> 18  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: coding  
sequence of N-terminal part of K2S protein

<400> 1  
tctgaggggaa acagtgcac 18

<210> 2  
<211> 1128  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: coding  
sequence for OmpA-K2S fusion protein

<400> 2  
atgaaaaaaga cagctatcgc gattgcagtg gcactggctg gtttcgctac cgtggcccag 60  
gcggcctctg agggaaacag tgactgctac tttgggaatg ggtcagccta ccgtggcacg 120  
cacagcctca ccgagtcggg tgccctctgc ctcccgtgga attccatgat cctgataggc 180  
aaggttttaca cagcacagaa ccccagtgcc caggcactgg gcctgggcaa acataattac 240  
tgccggaatc ctgatgggga tgccaagccc tgggtgccacg tgctgaagaa ccgcaggctg 300  
acgtgggagtg actgtgatgt gccctcctgc tccacctgcg gcctgagaca gtacagccag 360  
cctcagtttc gcatcaaagg agggctcttc gccgacatcg cctcccaccc ctggcagggt 420  
gccatctttg ccaagcacag gaggtcgccc ggagagcggg tcctgtgcgg gggcactac 480  
atcagctcct gctggattct ctctgcgcgc cactgcttcc aggagaggtt tccgccccac 540  
cacctgacgg tgatcttggg cagaacatac cgggtggtcc ctggcgagga ggagcagaaa 600  
tttgaagtcg aaaaatacat tgtccataag gaattcgatg atgacactta cgacaatgac 660  
attgcgctgc tgcagctgaa atcggattcg tcccgcgtgtg cccaggagag cagcgtgggc 720  
cgcactgtgt gccttcccc ggccggacctg cagctgccgg actggacgga gtgtgagctc 780  
tccggctacg gcaagcatga ggccttgtct cctttctatt cggagcgggt gaaggaggct 840  
catgtcagac tgtaccatc cagccgctgc acatcacaac atttacttaa cagaacagtc 900

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<210> 3
<211> 66
<212> DNA
<213> Escherichia coli
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<210> 4
<211> 1065
<212> DNA
<213> Artificial Sequence
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<400> 4							
tctgagggaa	acagtgactg	ctacttttggg	aatgggtcag	cctaccgtgg	cacgcacagc	60	
ctcaccgagt	cggtgtcctc	ctgcctcccg	tggaaattcca	tgatcctgat	aggcaaggtt	120	
tacacagcac	agaacccag	tgcccaggca	ctgggcctgg	gcaaacataa	ttactgccgg	180	
aatcctgtat	gggatgccaa	gccttggtgc	cacgtgotga	agaaccgcag	gctgacgtgg	240	
gagtagctgt	atgtgccctc	ctgtccacc	tgcggcctga	gacagtacag	ccagcctcag	300	
tttgcgcatca	aaggagggtc	cttcgccagc	atgcctccc	acccttgcca	ggctgccatc	360	
tttgccaagc	acaggaggtc	gccccgagag	cgtttcctgt	gcgggggcat	actcatcagc	420	
tcctgctgga	ttctctctgc	cgcccactgc	ttccaggaga	ggtttccgcc	ccaccacctg	480	
acggtgatct	tgggcagaac	ataccgggtg	gtccctggcg	aggaggagca	gaaatttgaa	540	
gtcgaaaaat	acattgtcca	taaggaattc	gatgatgaca	cttacgacaa	tgacatttgc	600	
ctctgtcgagc	tgaaatcgga	ttcgtcccg	tgtgccagc	agagcagctg	ggtccgcact	660	
gtgtgccttc	ccccggcgga	cctgcagctg	cgggactgga	cggagtgtga	gctctccggc	720	
tacggcaagc	atgaggcctt	gtctcctttc	tattcggagc	ggctgaagga	ggctcatgtc	780	
agactgtacc	catccagccg	ctgcacatca	caacatttac	ttaacagaa	agtcaccgac	840	
aacatgtctg	gtgctggaga	cactcggagc	ggcgggcccc	aggcaaaatt	gcacgacgcc	900	
tgcagggggt	attcgggagg	ccccctgggt	tgtctgaagc	atggccgcat	gacttttggtg	960	
ggcatcatca	gctggggcct	ggcgtgtgga	cagaaggatg	tccgggtgtg	gtacacaaag	1020	
gttaccaaact	acctagactg	gattcgtgac	aacatgcgac	cgtga		1065	

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<210> 5
<211> 1128
<212> DNA
<213> Artificial Sequence
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<220>  
<223> Description of Artificial Sequence: coding  
sequence for OmpA-K2S fusion protein

<400> 5						
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gcggcctctg	agggaaacag	tgactgctac	tttgggaatg	ggtcagccta	cgtggcacg	120
cacagcctca	ccgagtcggg	tgccctcctg	ctcccgctga	attccatgat	cctgataggc	180
aaggtttaca	cagcacagaa	ccccagtgcc	caggcactgg	gcctgggcaa	acataattac	240
tgccggaatc	ctgatgggga	tgccaaagccc	tggtgccacg	tgctgaagaa	cgcagggctg	300
acgtgggagt	actgtgatgt	gccctcctgc	tccacctgcg	gcctgagaca	gtacagccag	360



<400> 8

Met 1	Lys	Lys	Thr	Ala	Ile	Ala	Ile	Ala	Val	Ala	Leu	Ala	Gly	Phe	Ala
				5					10					15	
Thr	Val	Ala	Gln	Ala	Ala	Ser	Glu	Gly	Asn	Ser	Asp	Cys	Tyr	Phe	Gly
			20					25					30		
Asn	Gly	Ser	Ala	Tyr	Arg	Gly	Thr	His	Ser	Leu	Thr	Glu	Ser	Gly	Ala
		35					40					45			
Ser	Cys	Leu	Pro	Trp	Asn	Ser	Met	Ile	Leu	Ile	Gly	Lys	Val	Tyr	Thr
	50					55					60				
Ala	Gln	Asn	Pro	Ser	Ala	Gln	Ala	Leu	Gly	Leu	Gly	Lys	His	Asn	Tyr
65					70					75					80
Cys	Arg	Asn	Pro	Asp	Gly	Asp	Ala	Lys	Pro	Trp	Cys	His	Val	Leu	Lys
				85					90					95	
Asn	Arg	Arg	Leu	Thr	Trp	Glu	Tyr	Cys	Asp	Val	Pro	Ser	Cys	Ser	Thr
			100					105					110		
Cys	Gly	Leu	Arg	Gln	Tyr	Ser	Gln	Pro	Gln	Phe	Arg	Ile	Lys	Gly	Gly
		115					120					125			
Leu	Phe	Ala	Asp	Ile	Ala	Ser	His	Pro	Trp	Gln	Ala	Ala	Ile	Phe	Ala
	130					135					140				
Lys	His	Arg	Arg	Ser	Pro	Gly	Glu	Arg	Phe	Leu	Cys	Gly	Gly	Ile	Leu
145					150					155					160
Ile	Ser	Ser	Cys	Trp	Ile	Leu	Ser	Ala	Ala	His	Cys	Phe	Gln	Glu	Arg
				165					170					175	
Phe	Pro	Pro	His	His	Leu	Thr	Val	Ile	Leu	Gly	Arg	Thr	Tyr	Arg	Val
			180					185					190		
Val	Pro	Gly	Glu	Glu	Glu	Gln	Lys	Phe	Glu	Val	Glu	Lys	Tyr	Ile	Val
		195					200					205			
His	Lys	Glu	Phe	Asp	Asp	Asp	Thr	Tyr	Asp	Asn	Asp	Ile	Ala	Leu	Leu
	210					215					220				
Gln	Leu	Lys	Ser	Asp	Ser	Ser	Arg	Cys	Ala	Gln	Glu	Ser	Ser	Val	Val
225					230					235					240
Arg	Thr	Val	Cys	Leu	Pro	Pro	Ala	Asp	Leu	Gln	Leu	Pro	Asp	Trp	Thr
				245					250					255	
Glu	Cys	Glu	Leu	Ser	Gly	Tyr	Gly	Lys	His	Glu	Ala	Leu	Ser	Pro	Phe
			260					265					270		
Tyr	Ser	Glu	Arg	Leu	Lys	Glu	Ala	His	Val	Arg	Leu	Tyr	Pro	Ser	Ser
		275					280					285			
Arg	Cys	Thr	Ser	Gln	His	Leu	Leu	Asn	Arg	Thr	Val	Thr	Asp	Asn	Met
	290					295					300				
Leu	Cys	Ala	Gly	Asp	Thr	Arg	Ser	Gly	Gly	Pro	Gln	Ala	Asn	Leu	His
305					310					315					320

Gln Ala Leu Gly Leu Gly Lys His Asn Tyr Cys Arg Asn Pro Asp Gly  
50 55 60

Asp Ala Lys Pro Trp Cys His Val Leu Lys Asn Arg Arg Leu Thr Trp  
65 70 75 80

Glu Tyr Cys Asp Val Pro Ser Cys Ser Thr Cys Gly Leu Arg Gln Tyr  
85 90 95

Ser Gln Pro Gln Phe Arg Ile Lys Gly Gly Leu Phe Ala Asp Ile Ala  
100 105 110

Ser His Pro Trp Gln Ala Ala Ile Phe Ala Lys His Arg Arg Ser Pro  
115 120 125

Gly Glu Arg Phe Leu Cys Gly Gly Ile Leu Ile Ser Ser Cys Trp Ile  
130 135 140

Leu Ser Ala Ala His Cys Phe Gln Glu Arg Phe Pro Pro His His Leu  
145 150 155 160

Thr Val Ile Leu Gly Arg Thr Tyr Arg Val Val Pro Gly Glu Glu Glu  
165 170 175

Gln Lys Phe Glu Val Glu Lys Tyr Ile Val His Lys Glu Phe Asp Asp  
180 185 190

Asp Thr Tyr Asp Asn Asp Ile Ala Leu Leu Gln Leu Lys Ser Asp Ser  
195 200 205

Ser Arg Cys Ala Gln Glu Ser Ser Val Val Arg Thr Val Cys Leu Pro  
210 215 220

Pro Ala Asp Leu Gln Leu Pro Asp Trp Thr Glu Cys Glu Leu Ser Gly  
225 230 235 240

Tyr Gly Lys His Glu Ala Leu Ser Pro Phe Tyr Ser Glu Arg Leu Lys  
245 250 255

Glu Ala His Val Arg Leu Tyr Pro Ser Ser Arg Cys Thr Ser Gln His  
260 265 270

Leu Leu Asn Arg Thr Val Thr Asp Asn Met Leu Cys Ala Gly Asp Thr  
275 280 285

Arg Ser Gly Gly Pro Gln Ala Asn Leu His Asp Ala Cys Gln Gly Asp  
290 295 300

Ser Gly Gly Pro Leu Val Cys Leu Asn Asp Gly Arg Met Thr Leu Val  
305 310 315 320

Gly Ile Ile Ser Trp Gly Leu Gly Cys Gly Gln Lys Asp Val Pro Gly  
325 330 335

Val Tyr Thr Lys Val Thr Asn Tyr Leu Asp Trp Ile Arg Asp Asn Met  
340 345 350

Arg Pro

<210> 12  
<211> 331  
<212> PRT  
<213> Artificial Sequence

<223> Description of Artificial Sequence: K2S 197-527

Ser Gly Ala Ser Cys Leu Pro Trp Asn Ser Met Ile Leu Ile Gly Lys  
1 5 10 15

His Asn Tyr Cys Arg Asn Pro Asp Gly Asp Ala Lys Pro Trp Cys His  
35 40 45

Cys Ser Thr Cys Gly Leu Arg Gln Tyr Ser Gln Pro Gln Phe Arg Ile  
65 70 75 80

Ile Phe Ala Lys His Arg Arg Ser Pro Gly Glu Arg Phe Leu Cys Gly  
100 105 110

Gln Glu Arg Phe Pro Pro His His Leu Thr Val Ile Leu Gly Arg Thr  
130 135 140

Tyr Ile Val His Lys Glu Phe Asp Asp Asp Thr Tyr Asp Asn Asp Ile  
165 170 175

Ser Val Val Arg Thr Val Cys Leu Pro Pro Ala Asp Leu Gln Leu Pro  
195 200 205

Ser Pro Phe Tyr Ser Glu Arg Leu Lys Glu Ala His Val Arg Leu Tyr  
225 230 235 240

Asp Asn Met Leu Cys Ala Gly Asp Thr Arg Ser Gly Gly Pro Gln Ala  
260 265 270

Leu Asn Asp Gly Arg Met Thr Leu Val Gly Ile Ile Ser Trp Gly Leu  
290 295 300

Gly Cys Gly Gln Lys Asp Val Pro Gly Val Tyr Thr Lys Val Thr Asn

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<210> 13
<211> 339
<212> PRT
<213> Artificial Sequence
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<400>	13															
Ser	Glu	Gly	Asn	Ser	Leu	Thr	Glu	Ser	Gly	Ala	Ser	Cys	Leu	Pro	Trp	
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Asn	Ser	Met	Ile	Leu	Ile	Gly	Lys	Val	Tyr	Thr	Ala	Gln	Asn	Pro	Ser	
			20					25					30			
Ala	Gln	Ala	Leu	Gly	Leu	Gly	Lys	His	Asn	Tyr	Cys	Arg	Asn	Pro	Asp	
		35					40					45				
Gly	Asp	Ala	Lys	Pro	Trp	Cys	His	Val	Leu	Lys	Asn	Arg	Arg	Leu	Thr	
	50					55					60					
Trp	Glu	Tyr	Cys	Asp	Val	Pro	Ser	Cys	Ser	Thr	Cys	Gly	Leu	Arg	Gln	
65					70					75					80	
Tyr	Ser	Gln	Pro	Gln	Phe	Arg	Ile	Lys	Gly	Gly	Leu	Phe	Ala	Asp	Ile	
				85					90					95		
Ala	Ser	His	Pro	Trp	Gln	Ala	Ala	Ile	Phe	Ala	Lys	His	Arg	Arg	Ser	
			100					105					110			
Pro	Gly	Glu	Arg	Phe	Leu	Cys	Gly	Gly	Ile	Leu	Ile	Ser	Ser	Cys	Trp	
		115					120					125				
Ile	Leu	Ser	Ala	Ala	His	Cys	Phe	Gln	Glu	Arg	Phe	Pro	Pro	His	His	
	130					135					140					
Leu	Thr	Val	Ile	Leu	Gly	Arg	Thr	Tyr	Arg	Val	Val	Pro	Gly	Glu	Glu	
145					150					155					160	
Glu	Gln	Lys	Phe	Glu	Val	Glu	Lys	Tyr	Ile	Val	His	Lys	Glu	Phe	Asp	
			165						170					175		
Asp	Asp	Thr	Tyr	Asp	Asn	Asp	Ile	Ala	Leu	Leu	Gln	Leu	Lys	Ser	Asp	
		180						185					190			
Ser	Ser	Arg	Cys	Ala	Gln	Glu	Ser	Ser	Val	Val	Arg	Thr	Val	Cys	Leu	
		195					200					205				
Pro	Pro	Ala	Asp	Leu	Gln	Leu	Pro	Asp	Trp	Thr	Glu	Cys	Glu	Leu	Ser	
	210					215					220					
Gly	Tyr	Gly	Lys	His	Glu	Ala	Leu	Ser	Pro	Phe	Tyr	Ser	Glu	Arg	Leu	
225					230					235					240	
Lys	Glu	Ala	His	Val	Arg	Leu	Tyr	Pro	Ser	Ser	Arg	Cys	Thr	Ser	Gln	



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<210> 14
<211> 335
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: K2S 193-527,
      modified

<400> 14
Ser Leu Thr Glu Ser Gly Ala Ser Cys Leu Pro Trp Asn Ser Met Ile
 1          5          10          15
Leu Ile Gly Lys Val Tyr Thr Ala Gln Asn Pro Ser Ala Gln Ala Leu
          20          25          30
Gly Leu Gly Lys His Asn Tyr Cys Arg Asn Pro Asp Gly Asp Ala Lys
          35          40          45
Pro Trp Cys His Val Leu Lys Asn Arg Arg Leu Thr Trp Glu Tyr Cys
          50          55          60
Asp Val Pro Ser Ser Ser Thr Cys Gly Leu Arg Gln Tyr Ser Gln Pro
          65          70          75          80
Gln Phe Arg Ile Lys Gly Gly Leu Phe Ala Asp Ile Ala Ser His Pro
          85          90          95
Trp Gln Ala Ala Ile Phe Ala Lys His Arg Arg Ser Pro Gly Glu Arg
          100          105          110
Phe Leu Cys Gly Gly Ile Leu Ile Ser Ser Cys Trp Ile Leu Ser Ala
          115          120          125
Ala His Cys Phe Gln Glu Arg Phe Pro Pro His His Leu Thr Val Ile
          130          135          140
Leu Gly Arg Thr Tyr Arg Val Val Pro Gly Glu Glu Glu Gln Lys Phe
          145          150          155          160
Glu Val Glu Lys Tyr Ile Val His Lys Glu Phe Asp Asp Asp Thr Tyr

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<210> 15
<211> 343
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: K2S 191-527,
      modified

<400> 15
Ser Glu Gly Asn Ser Asp Thr His Ser Leu Thr Glu Ser Gly Ala Ser
  1              5              10              15
Cys Leu Pro Trp Asn Ser Met Ile Leu Ile Gly Lys Val Tyr Thr Ala
      20              25              30
Gln Asn Pro Ser Ala Gln Ala Leu Gly Leu Gly Lys His Asn Tyr Cys
      35              40              45
Arg Asn Pro Asp Gly Asp Ala Lys Pro Trp Cys His Val Leu Lys Asn
      50              55              60
Arg Arg Leu Thr Trp Glu Tyr Cys Asp Val Pro Ser Cys Ser Thr Cys
      65              70              75              80
Gly Leu Arg Gln Tyr Ser Gln Pro Gln Phe Arg Ile Lys Gly Gly Leu
      85              90              95
Phe Ala Asp Ile Ala Ser His Pro Trp Gln Ala Ala Ile Phe Ala Lys

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100					105					110					
His	Arg	Arg	Ser	Pro	Gly	Glu	Arg	Phe	Leu	Cys	Gly	Gly	Ile	Leu	Ile
		115					120					125			
Ser	Ser	Cys	Trp	Ile	Leu	Ser	Ala	Ala	His	Cys	Phe	Gln	Glu	Arg	Phe
		130					135					140			
Pro	Pro	His	His	Leu	Thr	Val	Ile	Leu	Gly	Arg	Thr	Tyr	Arg	Val	Val
Pro	Gly	Glu	Glu	Glu	Gln	Lys	Phe	Glu	Val	Glu	Lys	Tyr	Ile	Val	His
Lys	Glu	Phe	Asp	Asp	Asp	Thr	Tyr	Asp	Asn	Asp	Ile	Ala	Leu	Leu	Gln
			180					185					190		
Leu	Lys	Ser	Asp	Ser	Ser	Arg	Cys	Ala	Gln	Glu	Ser	Ser	Val	Val	Arg
			195				200					205			
Thr	Val	Cys	Leu	Pro	Pro	Ala	Asp	Leu	Gln	Leu	Pro	Asp	Trp	Thr	Glu
							215					220			
Cys	Glu	Leu	Ser	Gly	Tyr	Gly	Lys	His	Glu	Ala	Leu	Ser	Pro	Phe	Tyr
							230					235			
Ser	Glu	Arg	Leu	Lys	Glu	Ala	His	Val	Arg	Leu	Tyr	Pro	Ser	Ser	Arg
Cys	Thr	Ser	Gln	His	Leu	Leu	Asn	Arg	Thr	Val	Thr	Asp	Asn	Met	Leu
			260					265					270		
Cys	Ala	Gly	Asp	Thr	Arg	Ser	Gly	Gly	Pro	Gln	Ala	Asn	Leu	His	Asp
			275				280					285			
Ala	Cys	Gln	Gly	Asp	Ser	Gly	Gly	Pro	Leu	Val	Cys	Leu	Asn	Asp	Gly
							295					300			
Arg	Met	Thr	Leu	Val	Gly	Ile	Ile	Ser	Trp	Gly	Leu	Gly	Cys	Gly	Gln
							310					315			
Lys	Asp	Val	Pro	Gly	Val	Tyr	Thr	Lys	Val	Thr	Asn	Tyr	Leu	Asp	Trp
Ile	Arg	Asp	Asn	Met	Arg	Pro									

<210> 16

<211> 343

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: K2S 191-527,  
modified

<400> 16

Ser	Glu	Gly	Asn	Ser	Asp	Thr	His	Ser	Leu	Thr	Glu	Ser	Gly	Ala	Ser
1				5					10					15	

Cys Leu Pro Trp Asn Ser Met Ile Leu Ile Gly Lys Val Tyr Thr Ala

20					25					30						
Gln	Asn	Pro	Ser	Ala	Gln	Ala	Leu	Gly	Leu	Gly	Lys	His	Asn	Tyr	Cys	
35					40					45						
Arg	Asn	Pro	Asp	Gly	Asp	Ala	Lys	Pro	Trp	Cys	His	Val	Leu	Lys	Asn	
50					55					60						
Arg	Arg	Leu	Thr	Trp	Glu	Tyr	Cys	Asp	Val	Pro	Ser	Ser	Ser	Thr	Cys	
65					70					75					80	
Gly	Leu	Arg	Gln	Tyr	Ser	Gln	Pro	Gln	Phe	Arg	Ile	Lys	Gly	Gly	Leu	
85					90					95						
Phe	Ala	Asp	Ile	Ala	Ser	His	Pro	Trp	Gln	Ala	Ala	Ile	Phe	Ala	Lys	
100					105					110						
His	Arg	Arg	Ser	Pro	Gly	Glu	Arg	Phe	Leu	Cys	Gly	Gly	Ile	Leu	Ile	
115					120					125						
Ser	Ser	Cys	Trp	Ile	Leu	Ser	Ala	Ala	His	Cys	Phe	Gln	Glu	Arg	Phe	
130					135					140						
Pro	Pro	His	His	Leu	Thr	Val	Ile	Leu	Gly	Arg	Thr	Tyr	Arg	Val	Val	
145					150					155					160	
Pro	Gly	Glu	Glu	Glu	Gln	Lys	Phe	Glu	Val	Glu	Lys	Tyr	Ile	Val	His	
165					170					175						
Lys	Glu	Phe	Asp	Asp	Asp	Thr	Tyr	Asp	Asn	Asp	Ile	Ala	Leu	Leu	Gln	
180					185					190						
Leu	Lys	Ser	Asp	Ser	Ser	Arg	Cys	Ala	Gln	Glu	Ser	Ser	Val	Val	Arg	
195					200					205						
Thr	Val	Cys	Leu	Pro	Pro	Ala	Asp	Leu	Gln	Leu	Pro	Asp	Trp	Thr	Glu	
210					215					220						
Cys	Glu	Leu	Ser	Gly	Tyr	Gly	Lys	His	Glu	Ala	Leu	Ser	Pro	Phe	Tyr	
225					230					235					240	
Ser	Glu	Arg	Leu	Lys	Glu	Ala	His	Val	Arg	Leu	Tyr	Pro	Ser	Ser	Arg	
245					250					255						
Cys	Thr	Ser	Gln	His	Leu	Leu	Asn	Arg	Thr	Val	Thr	Asp	Asn	Met	Leu	
260					265					270						
Cys	Ala	Gly	Asp	Thr	Arg	Ser	Gly	Gly	Pro	Gln	Ala	Asn	Leu	His	Asp	
275					280					285						
Ala	Cys	Gln	Gly	Asp	Ser	Gly	Gly	Pro	Leu	Val	Cys	Leu	Asn	Asp	Gly	
290					295					300						
Arg	Met	Thr	Leu	Val	Gly	Ile	Ile	Ser	Trp	Gly	Leu	Gly	Cys	Gly	Gln	
305					310					315					320	
Lys	Asp	Val	Pro	Gly	Val	Tyr	Thr	Lys	Val	Thr	Asn	Tyr	Leu	Asp	Trp	
325					330					335						
Ile	Arg	Asp	Asn	Met	Arg	Pro										
340																

<220>  
<223> Description of Artificial Sequence: K2S 220-527

<400>	17															
Ser	Ala	Gln	Ala	Leu	Gly	Leu	Gly	Lys	His	Asn	Tyr	Cys	Arg	Asn	Pro	
1				5					10					15		
Asp	Gly	Asp	Ala	Lys	Pro	Trp	Cys	His	Val	Leu	Lys	Asn	Arg	Arg	Leu	
			20					25					30			
Thr	Trp	Glu	Tyr	Cys	Asp	Val	Pro	Ser	Cys	Ser	Thr	Cys	Gly	Leu	Arg	
		35					40					45				
Gln	Tyr	Ser	Gln	Pro	Gln	Phe	Arg	Ile	Lys	Gly	Gly	Leu	Phe	Ala	Asp	
	50					55					60					
Ile	Ala	Ser	His	Pro	Trp	Gln	Ala	Ala	Ile	Phe	Ala	Lys	His	Arg	Arg	
65					70					75					80	
Ser	Pro	Gly	Glu	Arg	Phe	Leu	Cys	Gly	Gly	Ile	Leu	Ile	Ser	Ser	Cys	
				85					90					95		
Trp	Ile	Leu	Ser	Ala	Ala	His	Cys	Phe	Gln	Glu	Arg	Phe	Pro	Pro	His	
			100					105					110			
His	Leu	Thr	Val	Ile	Leu	Gly	Arg	Thr	Tyr	Arg	Val	Val	Pro	Gly	Glu	
		115					120					125				
Glu	Glu	Gln	Lys	Phe	Glu	Val	Glu	Lys	Tyr	Ile	Val	His	Lys	Glu	Phe	
	130					135					140					
Asp	Asp	Asp	Thr	Tyr	Asp	Asn	Asp	Ile	Ala	Leu	Leu	Gln	Leu	Lys	Ser	
145					150					155					160	
Asp	Ser	Ser	Arg	Cys	Ala	Gln	Glu	Ser	Ser	Val	Val	Arg	Thr	Val	Cys	
				165					170					175		
Leu	Pro	Pro	Ala	Asp	Leu	Gln	Leu	Pro	Asp	Trp	Thr	Glu	Cys	Glu	Leu	
			180					185					190			
Ser	Gly	Tyr	Gly	Lys	His	Glu	Ala	Leu	Ser	Pro	Phe	Tyr	Ser	Glu	Arg	
		195					200					205				
Leu	Lys	Glu	Ala	His	Val	Arg	Leu	Tyr	Pro	Ser	Ser	Arg	Cys	Thr	Ser	
	210					215					220					
Gln	His	Leu	Leu	Asn	Arg	Thr	Val	Thr	Asp	Asn	Met	Leu	Cys	Ala	Gly	
225					230					235					240	
Asp	Thr	Arg	Ser	Gly	Gly	Pro	Gln	Ala	Asn	Leu	His	Asp	Ala	Cys	Gln	
				245					250				255			
Gly	Asp	Ser	Gly	Gly	Pro	Leu	Val	Cys	Leu	Asn	Asp	Gly	Arg	Met	Thr	
			260					265					270			
Leu	Val	Gly	Ile	Ile	Ser	Trp	Gly	Leu	Gly	Cys	Gly	Gln	Lys	Asp	Val	
		275					280					285				

Pro Gly Val Tyr Thr Lys Val Thr Asn Tyr Leu Asp Trp Ile Arg Asp  
290 295 300

Asn Met Arg Pro  
305

<210> 18  
<211> 268  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: K2S 260-527

<400> 18  
Ser Cys Ser Thr Cys Gly Leu Arg Gln Tyr Ser Gln Pro Gln Phe Arg  
1 5 10 15  
Ile Lys Gly Gly Leu Phe Ala Asp Ile Ala Ser His Pro Trp Gln Ala  
20 25 30  
Ala Ile Phe Ala Lys His Arg Arg Ser Pro Gly Glu Arg Phe Leu Cys  
35 40 45  
Gly Gly Ile Leu Ile Ser Ser Cys Trp Ile Leu Ser Ala Ala His Cys  
50 55 60  
Phe Gln Glu Arg Phe Pro Pro His His Leu Thr Val Ile Leu Gly Arg  
65 70 75 80  
Thr Tyr Arg Val Val Pro Gly Glu Glu Glu Gln Lys Phe Glu Val Glu  
85 90 95  
Lys Tyr Ile Val His Lys Glu Phe Asp Asp Asp Thr Tyr Asp Asn Asp  
100 105 110  
Ile Ala Leu Leu Gln Leu Lys Ser Asp Ser Ser Arg Cys Ala Gln Glu  
115 120 125  
Ser Ser Val Val Arg Thr Val Cys Leu Pro Pro Ala Asp Leu Gln Leu  
130 135 140  
Pro Asp Trp Thr Glu Cys Glu Leu Ser Gly Tyr Gly Lys His Glu Ala  
145 150 155 160  
Leu Ser Pro Phe Tyr Ser Glu Arg Leu Lys Glu Ala His Val Arg Leu  
165 170 175  
Tyr Pro Ser Ser Arg Cys Thr Ser Gln His Leu Leu Asn Arg Thr Val  
180 185 190  
Thr Asp Asn Met Leu Cys Ala Gly Asp Thr Arg Ser Gly Gly Pro Gln  
195 200 205  
Ala Asn Leu His Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro Leu Val  
210 215 220  
Cys Leu Asn Asp Gly Arg Met Thr Leu Val Gly Ile Ile Ser Trp Gly  
225 230 235 240  
Leu Gly Cys Gly Gln Lys Asp Val Pro Gly Val Tyr Thr Lys Val Thr

255

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<210> 19
<211> 527
<212> PRT
<213> Homo sapiens
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Ser Tyr Gln Val Ile Cys Arg Asp Glu Lys Thr Gln Met Ile Tyr Gln  
1 5 10 15

Gln His Gln Ser Trp Leu Arg Pro Val Leu Arg Ser Asn Arg Val Glu  
20 25 30

Tyr Cys Trp Cys Asn Ser Gly Arg Ala Gln Cys His Ser Val Pro Val  
35 40 45

Lys Ser Cys Ser Glu Pro Arg Cys Phe Asn Gly Gly Thr Cys Gln Gln  
50 55 60

Ala Leu Tyr Phe Ser Asp Phe Val Cys Gln Cys Pro Glu Gly Phe Ala  
65 70 75 80

Gly Lys Cys Cys Glu Ile Asp Thr Arg Ala Thr Cys Tyr Glu Asp Gln  
85 90 95

Gly Ile Ser Tyr Arg Gly Thr Trp Ser Thr Ala Glu Ser Gly Ala Glu  
100 105 110

Cys Thr Asn Trp Asn Ser Ser Ala Leu Ala Gln Lys Pro Tyr Ser Gly  
115 120 125

Arg Arg Pro Asp Ala Ile Arg Leu Gly Leu Gly Asn His Asn Tyr Cys  
130 135 140

Arg Asn Pro Asp Arg Asp Ser Lys Pro Trp Cys Tyr Val Phe Lys Ala  
145 150 155 160

Gly Lys Tyr Ser Ser Glu Phe Cys Ser Thr Pro Ala Cys Ser Glu Gly  
165 170 175

Asn Ser Asp Cys Tyr Phe Gly Asn Gly Ser Ala Tyr Arg Gly Thr His  
180 185 190

Ser Leu Thr Glu Ser Gly Ala Ser Cys Leu Pro Trp Asn Ser Met Ile  
195 200 205

Leu Ile Gly Lys Val Tyr Thr Ala Gln Asn Pro Ser Ala Gln Ala Leu  
210 215 220

Gly Leu Gly Lys His Asn Tyr Cys Arg Asn Pro Asp Gly Asp Ala Lys  
225 230 235 240

Pro Trp Cys His Val Leu Lys Asn Arg Arg Leu Thr Trp Glu Tyr Cys  
245 250 255

Asp Val Pro Ser Cys Ser Thr Cys Gly Leu Arg Gln Tyr Ser Gln Pro  
260 265 270

Gln Phe Arg Ile Lys Gly Gly Leu Phe Ala Asp Ile Ala Ser His Pro  
275 280 285

Trp Gln Ala Ala Ile Phe Ala Lys His Arg Arg Ser Pro Gly Glu Arg  
290 295 300

Phe Leu Cys Gly Gly Ile Leu Ile Ser Ser Cys Trp Ile Leu Ser Ala  
305 310 315 320

Ala His Cys Phe Gln Glu Arg Phe Pro Pro His His Leu Thr Val Ile  
325 330 335

Leu Gly Arg Thr Tyr Arg Val Val Pro Gly Glu Glu Glu Gln Lys Phe  
340 345 350

Glu Val Glu Lys Tyr Ile Val His Lys Glu Phe Asp Asp Asp Thr Tyr  
355 360 365

Asp Asn Asp Ile Ala Leu Leu Gln Leu Lys Ser Asp Ser Ser Arg Cys  
370 375 380

Ala Gln Glu Ser Ser Val Val Arg Thr Val Cys Leu Pro Pro Ala Asp  
385 390 395 400

Leu Gln Leu Pro Asp Trp Thr Glu Cys Glu Leu Ser Gly Tyr Gly Lys  
405 410 415

His Glu Ala Leu Ser Pro Phe Tyr Ser Glu Arg Leu Lys Glu Ala His  
420 425 430

Val Arg Leu Tyr Pro Ser Ser Arg Cys Thr Ser Gln His Leu Leu Asn  
435 440 445

Arg Thr Val Thr Asp Asn Met Leu Cys Ala Gly Asp Thr Arg Ser Gly  
450 455 460

Gly Pro Gln Ala Asn Leu His Asp Ala Cys Gln Gly Asp Ser Gly Gly  
465 470 475 480

Pro Leu Val Cys Leu Asn Asp Gly Arg Met Thr Leu Val Gly Ile Ile  
485 490 495

Ser Trp Gly Leu Gly Cys Gly Gln Lys Asp Val Pro Gly Val Tyr Thr  
500 505 510

Lys Val Thr Asn Tyr Leu Asp Trp Ile Arg Asp Asn Met Arg Pro  
515 520 525

<210> 20  
<211> 12  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: coding  
sequence for SEGN

<400> 20  
tctgagggaa ac



<210> 21  
<211> 22  
<212> PRT  
<213> Escherichia coli

<400> 21  
Met Lys Lys Thr Ala Ile Ala Ile Ala Val Ala Leu Ala Gly Phe Ala  
1 5 10 15  
Thr Val Ala Gln Ala Ala  
20

<210> 22  
<211> 42  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: primer

<400> 22  
gaggaggagg tggcccaggc ggcctctgag ggaaacagtg ac 42

<210> 23  
<211> 42  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: primer

<400> 23  
gaggaggagc tggccggcct ggcccggtcg catgttgtca cg 42

<210> 24  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: primer

<400> 24  
acatgcgacc gtgacaggcc ggccag 26

<210> 25  
<211> 26  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: primer

<400> 25  
ctggcgggcc tgtcacggtc gcatgt 26